

Serial No. 09/881,554
Docket No. DP-304198

REMARKS

In the Office Action, the Examiner reviewed claims 1-40 of the above-identified US Patent Application, with the result that claims 1-5, 7, 8, 10-25 and 27-40 were rejected under 35 USC §103, and claims 6 and 9 (which depend from claim 1) and claim 26 (which depends from claim 21) were deemed to recite allowable subject matter. In response, Applicant has amended the claims as set forth above. More particularly:

Dependent claims 10 and 30 have been rewritten in independent form to include all of the limitations of their respective parent claims 1 and 21. Furthermore, claims 10 and 30 have been amended to use the term "electrical devices" instead of "capacitors" (76), recite that the electrical devices (76) comprise a first set of terminals (74), and that the joint structure (72) bonds the first set of terminals (74) together. Similarly, claims 11 and 31 have been amended to recite that the electrical devices (76) comprise a second set of terminals (74), and that the second joint structure (73) bonds the second set of terminals (74) together. Support for these amendments can be found in Applicant's specification at paragraph [0022] and Figure 5.

Dependent claims 6 and 26 have been canceled and their limitations incorporated into their respective parent claims 1 and 21 pursuant to the Examiner's conclusion that claims 6 and 26 recite allowable subject matter. As such, independent claims 1 and 21 and their remaining dependent claims 2-5, 7-9, 22-25 and 27-29 are believed to be allowable over the prior art of record.

Serial No. 09/881,554
Docket No. DP-304198

Because dependent claims 18 and 38 (which depend from independent claims 14 and 34, respectively) recite the same limitations as allowable claims 6 and 26, claims 18 and 38 have also been canceled and their limitations incorporated into their respective parent claims 14 and 34. As such, independent claims 14 and 34 and their remaining dependent claims 15-17, 19, 20, 35-37, 39 and 40 are also believed to be allowable over the prior art of record.

Applicant believes that the above amendments do not present new matter. Favorable reconsideration and allowance of remaining claims 1-5, 7-17, 19-25, 27-37, 39 and 40 are respectfully requested in view of the above amendments and the following remarks.

Prior Art Rejections

The Examiner rejected claims 1-5, 7, 8, 10-25 and 27-40 under 35 USC §103 in view of two or more of U.S. Patent Nos. 5,136,122 to Kwitkowski et al. (Kwitkowski), 6,083,772 to Bowman et al. (Bowman), 4,529,836 to Powers et al. (Powers), 6,280,584 to Kumar et al. (Kumar) and 5,591,034 to Ameen et al. (Ameen). As noted above, Applicant has amended independent claims 1, 14, 21 and 34 to incorporate the allowable subject matter of claims 6, 18, 26 and 38. Applicant therefore respectfully requests withdrawal of the rejections of claims 1-5, 7-9, 14-17, 19-25, 27-29, 34-37, 39 and 40 under 35 USC §103.

Serial No. 09/881,554
Docket No. DP-304198

Applicant respectfully traverses the remaining rejections of claims 10-13 and 30-33 in view of the amendments presented above as well as the following comments.

Independent claims 10 and 30 and their dependent claims 11-13 and 31-33 were rejected under 35 USC §103(a) as follows: claims 10-13 were rejected as being unpatentable over Kwitkowski in view of Bowman and Powers; claims 30-32 were rejected as being unpatentable over Bowman in view of Powers; and claim 33 was rejected as being unpatentable over Bowman in view of Powers and Kumar. Applicant's invention recited in claims 10-13 and 30-33 is directed to the embodiment shown in Figures 5 and 6 and described in paragraphs [0022] and [0023] of the specification. Specifically, claims 10 and 30 recite an electrical circuit assembly (70) that comprises a component (78) formed of multiple electrical devices (76) and which is bonded with at least one joint structure (72,73) to a conductor (82). The joint structure (72,73) comprises a mesh (14) infiltrated by a solder material (16). The electrical devices (76) have a first set of terminals (74) that are bonded together with the joint structure (72,73) so as to hold the devices (76) together. The joint structure (72,73) also bonds the first set of terminals (74) to the conductor (82).

None of the references applied under the §103 rejections discloses or suggests the use of a joint structure (72,73) comprising a mesh (14) infiltrated with solder (16) and which, in addition to bonding a circuit component (78) to a substrate, also bonds together

Serial No. 09/881,554
Docket No. DP-304198

multiple electrical devices (76) that constitute the component (78). Therefore, Applicant respectfully requests withdrawal of the rejections of claims 10-13 and 30-33 under 35 USC §103(a).

Closing

In view of the above, Applicant believes that all rejections to his claims have been overcome, and that the claims define patentable novelty over all the references, alone or in combination, of record. It is therefore respectfully requested that this patent application be given favorable reconsideration.

Should the Examiner have any questions with respect to any matter now of record, Applicant's representative may be reached at (219) 462-4999.

Respectfully submitted,

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Attachment: Appendix A

Serial No. 09/881,554
Docket No. DP-304198

APPENDIX A
(Page 1 of 4)

VERSION WITH MARKINGS TO SHOW CHANGES MADE¹

In the Claims:

Claims 1, 10, 11, 14, 21, 30, 31 and 34 have been amended as follows:

1. (Amended) An electrical circuit assembly comprising two components bonded together with a joint structure, the joint structure comprising a mesh infiltrated by a solder material, a portion of the mesh extending outside of the joint structure to define a flexible jumper to a first of the components.

10. (Amended) An [The] electrical circuit assembly [according to claim 1] comprising two components bonded together with a joint structure, the joint structure comprising a mesh infiltrated by a solder material, wherein a first of the components comprises multiple electrical devices [capacitors] with a first set of terminals bonded together with the joint structure so as to hold the electrical devices together, a second of the components is a conductor on a substrate, and the joint structure bonds the first set of terminals [one terminal of each capacitor] to the conductor.

11. (Amended) The electrical circuit assembly according to claim 10, further

¹ Brackets “[]” indicate deletions and underlining “ ” indicates insertions.

Serial No. 09/881,554
Docket No. DP-304198

APPENDIX A
(Page 2 of 4)

comprising a second joint structure comprising a mesh infiltrated by a solder material, the mesh of the second joint structure being formed of a material having a higher thermal conductivity than the solder material of the second joint structure, the electrical devices having a second set of terminals bonded together with the second joint structure [bonding a second of the terminals to the substrate].

14. (Amended) A semiconductor assembly comprising a heat-generating semiconductor device that is attached to a conductor on a substrate with a joint structure, the joint structure comprising a mesh infiltrated by a solder material that bonds together the semiconductor device, the conductor and the mesh, a portion of the mesh extending outside of the joint structure to define a flexible jumper to the semiconductor device, the mesh being formed of a material having a higher thermal conductivity than the solder material, the mesh substantially establishing the thickness of the joint structure.

21. (Amended) A method of bonding together two components with a joint structure, the method comprising the step of forming the joint structure of a mesh infiltrated by a solder material, the joint structure being formed so that a portion of the mesh extends outside of the joint structure to define a flexible jumper to a first of the components.

Serial No. 09/881,554
Docket No. DP-304198

APPENDIX A
(Page 3 of 4)

30. (Amended) A [The] method of bonding together two components with a joint structure, the method comprising the step of forming the joint structure of a mesh infiltrated by a solder material [according to claim 21], wherein a first of the components is a circuit element comprising multiple electrical devices [capacitors] with a first set of terminals, a second of the components is a conductor on a substrate, and the joint structure is formed to bond the first set of terminals [one terminal of each capacitor] to the substrate.

31. (Amended) The method according to claim 30, further comprising the step of forming a second joint structure to bond together a second set of [the] terminals of the electrical devices [to the substrate], the second joint structure comprising a mesh infiltrated by a solder material, the mesh of the second joint structure being formed of a material having a higher thermal conductivity than the solder material of the second joint structure.

34. (Amended) A method of attaching a heat-generating semiconductor device to a conductor on a substrate with a joint structure, the method comprising the steps of:

providing on the conductor a preliminary structure comprising a mesh and a solder material, the mesh being formed of a material having a higher thermal conductivity

Serial No. 09/881,554
Docket No. DP-304198

APPENDIX A
(Page 4 of 4)

than the solder material;

placing the semiconductor device on the preliminary structure; and then

forming the joint structure by heating the preliminary structure so that the

solder material melts, infiltrates the mesh, and bonds together the semiconductor device,

the conductor and the mesh, a portion of the mesh extending outside of the joint structure

to define a flexible jumper to the semiconductor device, the mesh substantially

establishing the thickness of the joint structure.

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